

In the claims:

1. (currently amended) A process carried out by a ~~device~~  
computer for determining and outputting a transforming element  
 for a given transformation function for a transformation of a  
 digital signal representing audio, video or an image, which  
 transformation function comprises a transformation matrix and  
 corresponds to a transformation of the digital signal from the  
 time domain into the frequency domain or vice versa, comprising  
 the steps of:

executing instructions on the computer that cause the  
computer to decompose ~~decomposing~~ the transformation  
 matrix into a rotation matrix and an auxiliary matrix  
 which, when multiplied with itself, equals a permutation  
 matrix multiplied with an integer diagonal matrix;

executing instructions on the computer that cause the  
computer to decompose ~~decomposing~~ the rotation matrix and  
 the auxiliary matrix into a plurality of lifting  
 matrices;

executing instructions on the computer that cause the  
computer to determine ~~determining~~ the transforming  
 element is comprised of a plurality of lifting stages  
 which correspond to the lifting matrices; ~~and.~~

2. (previously presented) The process of claim 1, wherein the  
 transformation function is a Discrete Cosine Transform-I  
 transformation function, Discrete Cosine Transform-IV  
 transformation function, Discrete Sine Transform-I  
 transformation function, Discrete Sine Transform-IV  
 transformation function, Discrete Fourier Transform-I  
 transformation function, Discrete Fourier Transform-IV

transformation function, Discrete Wavelet Transform-I transformation function or Discrete Wavelet Transform-IV transformation function.

3. (previously presented) The process of claim 1, wherein the lifting matrices are each block-triangular matrices with two invertible integer matrices in one diagonal.

4. (original) The process of claim 3, wherein the invertible integer matrices in each lifting matrix are identity matrices or negative identity matrices.

5. (previously presented) The process of 4 claim 1, wherein the transforming element comprises five lifting stages.

6. (previously presented) The process of claim 1, wherein an audio signal or a video signal is used as the digital signal.

7. (currently amended) A ~~device~~ computer system for determining and outputting a transforming element for a given transformation function for a transformation of a digital signal, which transformation function comprises a transformation matrix and corresponds to a transformation of the digital signal from the time domain into the frequency domain or vice versa, ~~the device~~ comprising instructions to cause the computer system to:

~~a first decomposition unit for decomposing~~ decompose the transformation matrix into a rotation matrix and an auxiliary matrix which, when multiplied with itself, equals a permutation matrix multiplied with an integer diagonal matrix;

~~a second decomposition unit for decomposing~~ decompose the rotation matrix and the auxiliary matrix each into a plurality of lifting matrices;

~~a determination unit for determining~~ decompose the transforming element to comprise of a plurality of lifting stages which correspond to the lifting matrices; and

~~outputting~~ output the transforming element for a predetermined application.

8. (currently amended) A method carried out by a computer for transforming and outputting a digital signal from the time domain into the frequency domain or vice versa using a transforming element representing audio, video or an image, wherein

the transforming element corresponds to a given transformation function, which transformation function comprises a transformation matrix wherein the transforming element is determined by a process comprising:

executing the instructions on the computer that cause the computer to decompose ~~decomposing~~ the transformation matrix into a rotation matrix and an auxiliary matrix which, when multiplied with itself, equals a permutation matrix multiplied with an integer diagonal matrix;

executing the instructions on the computer that cause the computer to determine ~~decomposing~~ the rotation matrix and

the auxiliary matrix each into a plurality of lifting matrices; and

executing the instructions on the computer that cause the computer to determine ~~determining~~ the transforming element to comprise of a plurality of lifting stages which correspond to the lifting matrices;

wherein each lifting stage comprises the processing of sub-blocks of the digital signal by an auxiliary transformation and by a rounding unit.

9. (currently amended) A ~~device~~ computer system for transforming and outputting a digital signal from the time domain into the frequency domain or vice versa comprising a transformation unit for transforming the digital signal by a transforming element, wherein

the transforming element corresponds to a given transformation function, which transformation function comprises a transformation matrix wherein the transforming element is determined by a process comprising:

executing instructions on the computer that cause the computer to decompose ~~decomposing~~ the transformation matrix into a rotation matrix and an auxiliary matrix which, when multiplied with itself, equals a permutation matrix multiplied with an integer diagonal matrix;

executing instructions on the computer that cause the computer to determine ~~decomposing~~ the rotation matrix and

the auxiliary matrix each into a plurality of lifting matrices;

executing instructions on the computer that cause the computer to determine ~~determining~~ the transforming element to comprise of a plurality of lifting stages which correspond to the lifting matrices; and

wherein for each lifting stage the ~~device~~ computer system comprises an auxiliary transformation unit for processing sub-blocks of the digital signal and a rounding unit for processing sub-blocks of the digital signal.

10. (previously presented) A computer readable medium having a program recorded thereon, wherein the program is executed to make a computer perform a process for determining a transforming element for a given transformation function for digital signal transformation, which transformation function comprises a transformation matrix and corresponds to a transformation of a digital signal from the time domain into the frequency domain or vice versa, comprising:

the transformation matrix is decomposed into a rotation matrix and an auxiliary matrix which, when multiplied with itself, equals a permutation matrix multiplied with an integer diagonal matrix;

the rotation matrix and the auxiliary matrix are each decomposed into a plurality of lifting matrices;

the transforming element is determined to comprise of a plurality of lifting stages which correspond to the lifting matrices.

11. (previously presented) A computer readable medium having a program recorded thereon, wherein the program is executed to make a computer perform a method for transforming and outputting a digital signal from the time domain into the frequency domain or vice versa using a transforming element, comprising:

the transforming element corresponds to a given transformation function, which transformation function comprises a transformation matrix wherein the transforming element is determined by a process comprising

decomposing the transformation matrix into a rotation matrix and an auxiliary matrix which, when multiplied with itself, equals a permutation matrix multiplied with an integer diagonal matrix;

decomposing the rotation matrix and the auxiliary matrix each into a plurality of lifting matrices;

determining the transforming element to comprise of a plurality of lifting stages which correspond to the lifting matrices;

each lifting stage comprises the processing of sub-blocks of the digital signal by auxiliary transformations and by a rounding unit.

12. (previously presented) The process of claim 2, wherein the lifting matrices are each block-triangular matrices with two invertible integer matrices in one diagonal.

13. (previously presented) The process of claim 12, wherein the invertible integer matrices in each lifting matrix are identity matrices or negative identity matrices.